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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/909,111	07/18/2001	Mark Fischer	MI22-1777	1837

7590

12/21/2001

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EXAMINER

DEO, DUY VU

ART UNIT

PAPER NUMBER

1765

DATE MAILED: 12/21/2001

Please find below and/or attached an Office communication concerning this application or proceeding.

AS-3

Office Action Summary

Application No.

09/909,111

Applicant(s)

FISCHER ET AL.

Examiner

DuyVu n Deo

Art Unit

1765

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 12,13,16,21-23 and 47-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12,13,16,21-23 and 47-50 is/are rejected.
- 7) ☒ Claim(s) 51-59 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 59 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has not show where in the specification teaching that the side surfaces of the conductive material define a maximum width of the outer portion of the conductive material within the opening.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 59 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The maximum width would have only one value. However, in the specification, the width of the conductive plug (or conductive material) depends on the size of the opening in the insulative material. The specification doesn't describe what the maximum size or value of the opening would be. It is unclear what applicant's maximum width would be. Also, since the size of the opening doesn't have a maximum value or it could be varied, the maximum width is a

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relative term and would have different value. Therefore, the maximum width is vague and indefinite.

Since there is no value to the maximum width "effectively reducing the maximum width..." is also vague and indefinite.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12, 13, 16, 21-23, 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crotti (US 4,957,881).

Crotti describes a method for forming an integrated circuit comprising: forming a conductive plug over the substrate between a pair of conductive lines and the conductive plug having an uppermost surface (claim 1st uppermost surface); etching the conductive plug to remove more material from the corner region than from the central region (fig. 4-9, col. 2-4). Unlike claimed invention, Crotti doesn't describe forming the conductive plug with which electrical communication with a bit line is desired in the process of forming DRAM circuitry. However, it would be obvious for one skill in the art that depending on the type of integrated circuit being fabricated the conductive plug can be formed electrically communication with a bit line because Crotti teaches a similar method as that of the claims having the same conductive material and conductive lines.

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7. Claims 48-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Crotti and further in view of Fazan et al. (US 5,597,756).

Unlike claimed invention, Crotti doesn't describe forming two adjacent conductive plugs and forming and etching an insulative layer over the conductive plug with a contact opening. Fazan describes a method of forming a similar integrated circuit such as DRAM wherein he teaches forming several conductive plugs, which would be obvious to one skill in the art, and forming and etching an insulating layer on the conductive plugs (col. 3, line 15-col. 4, line 13). It would have been obvious for one skill in the art to modify Crotti in light of Fazan to form and etch an insulating layer on the conductive plugs because Fazan teaches further steps that would complete the fabrication of an integrated circuit started by Crotti. This modification would produce the claimed invention with an anticipation of an expected result.

Allowable Subject Matter

8. Claims 51-58 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 51-58 are allowable over applied prior art because Crotti doesn't teach the uppermost surface of the conductive is entirely outwardly exposed while the corner being etched and he doesn't removes material of the conductive plug from an entirety of the uppermost surface and therefore, not reducing a maximum height of the conductive plug over the diffusion region. Figures 5 of Crotti show the conductive plug is not substantially planar prior to etching.

9. Claim 59 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

Claim 59 is allowable over applied prior art because Crotti doesn't describe removing material of the conductive plug from an entirety of the uppermost surface.

Response to Arguments

10. Referring to applicant's argument that Crotti doesn't teach or suggest forming of a first uppermost surface and modifying the first surface to form a second uppermost surface. Figures 4 and 6 would certainly shows two uppermost surface, the before and after (or claimed 1st and 2nd surfaces). They shows "unevenly removing material from the first surface of the conductive plug to define an uneven second uppermost surface," "the beveling changing a first generally even uppermost surface to a second generally uneven uppermost surface," or "etching material of the conductive plug to define a second uppermost surface which is generally non-planar."

Applicant's argument that Fazan does not teach or even suggest forming a first uppermost surface and etching that surface to form a second uppermost surface is acknowledged. However, in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Double Patenting

11. Claims 12, 13, 16, 21-23, 51-55 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4, 6, 8-10, 12, 13, 20, 24, 27-34 of U.S. Patent No. 6,309,973. Although the conflicting claims are not identical, they are not patentably distinct from each other because they describe a method of beveling the corner of conductive.

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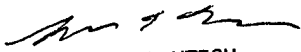
12. Claims 48-50, 56-58 rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-4, 6, 8-10, 12, 13, 20, 24, 27-34 of U.S. Patent No. 6,309,973 in view of Fazan et al. (US 5,597,756).

Unlike claimed invention, patent '973 doesn't describe forming and etching an insulative layer over the conductive plug with a contact opening. Fazan describes a method of forming an similar integrated circuit such as DRAM wherein he teaches forming several conductive plugs, which would be obvious to one skill in the art, and forming and etching an insulating layer on the conductive plugs (col. 3, line 15-col. 4, line 13). It would have been obvious for one skill in the art in light of Fazan to form and etch an insulating layer on the conductive plugs because Fazan teaches further steps that would complete the fabrication of an integrated circuit such as a DRAM. This modification would produce the claimed invention with an anticipation of an expected result.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to DuyVu n Deo whose telephone number is 703-305-0515.

DVD

December 19, 2001


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